

WHAT IS CLAIMED IS:

1. A method of detecting a malfunction during
a die clamping step in an injection molding machine,
the method being applied when performing die clamping
by moving a movable platen toward a stationary platen,
5 comprising:

taking a reference pattern showing a relation
between a die clamping force and a position of the
movable platen when die clamping is normally carried
10 out;

setting one or more monitoring sections with
respect to said position on the basis of the reference
pattern, and setting, in advance, an allowable limit
value of the die clamping force in the respective
15 monitoring section in a form of a linear function of
said position; and

monitoring the die clamping force in the
respective monitoring section during the die clamping
step and, when its value exceeds said allowable limit
20 value, issuing an alarm.

2. The method according to claim 1, wherein said
injection molding machine is equipped with an
electrically driven die clamping unit using a toggle
mechanism, and said die clamping force is calculated
25 based on a torque of a motor for driving the toggle
mechanism and expansion/contraction amount of the
toggle mechanism.

3. A method of detecting a malfunction during a die clamping step in an injection molding machine, the method being applied when performing die clamping by moving a movable platen toward a stationary platen, comprising:

taking a reference pattern showing a relation between a die clamping force and a position of the movable platen when die clamping is normally carried out;

setting one or more monitoring sections with respect to said position on the basis of the reference pattern, and setting, in advance, an allowable limit value of the die clamping force in the respective monitoring section in a form of a linear function of said position; and

monitoring the die clamping force in the respective monitoring section during the die clamping step and, when its value exceeds said allowable limit value, deciding that a malfunction occurs and counting the number of times that a malfunction is detected; and issuing an alarm when the count of malfunctions detected in any monitoring section reaches a predetermined number for the section.

4. The method according to claim 3, wherein said injection molding machine is equipped with an electrically driven die clamping unit using a toggle mechanism, and said die clamping force is calculated

based on a torque of a motor for driving the toggle mechanism and expansion/contraction amount of the toggle mechanism.

5 5. A method of detecting a malfunction during a die clamping step in an injection molding machine, the method being applied when performing die clamping by moving a movable platen toward a stationary platen, comprising:

10 taking a reference pattern showing a relation between a die clamping force and a position of the movable platen when die clamping is normally carried out;

15 setting one or more monitoring sections with respect to said position on the basis of the reference pattern, and setting, in advance, an allowable limit value of the die clamping force in the respective monitoring section in a form of a linear function of said position; and

20 monitoring the die clamping force in the respective monitoring section during the die clamping step and, when its value exceeds said allowable limit value, deciding that a malfunction occurs and counting the number of times that a malfunction is detected; and

25 issuing an alarm when the count of malfunctions detected within a predetermined time reaches a predetermined number for the respective monitoring section.

6. The method according to claim 5, wherein said injection molding machine is equipped with an electrically driven die clamping unit using a toggle mechanism, and said die clamping force is calculated
5 based on a torque of a motor for driving the toggle mechanism and expansion/contraction amount of the toggle mechanism.

7. A method of detecting a malfunction during a die clamping step in an injection molding machine,
10 the method being applied when performing die clamping by moving a movable platen toward a stationary platen, comprising:

taking a reference pattern showing a relation between a die clamping force and time when die clamping
15 is normally carried out;

setting one or more monitoring sections with respect to said time on the basis of the reference pattern, and setting, in advance, an allowable limit value of the die clamping force in the respective
20 monitoring section in a form of a linear function of said time; and

monitoring the die clamping force in the respective monitoring section during the die clamping step and, when its value exceeds said allowable limit
25 value, issuing an alarm.

8. The method according to claim 7, wherein said injection molding machine is equipped with

an electrically driven die clamping unit using a toggle mechanism, and said die clamping force is calculated based on a torque of a motor for driving the toggle mechanism and expansion/contraction amount of the toggle mechanism.

9. A method of detecting a malfunction during a die clamping step in an injection molding machine, the method being applied when performing die clamping by moving a movable platen toward a stationary platen, comprising:

taking a reference pattern showing a relation between a die clamping force and time when die clamping is normally carried out;

setting one or more monitoring sections with respect to said time on the basis of the reference pattern, and setting, in advance, an allowable limit value of the die clamping force in the respective monitoring section in a form of a linear function of said time; and

monitoring the die clamping force in the respective monitoring section during the die clamping step and, when its value exceeds said allowable limit value, deciding that a malfunction occurs and counting the number of times that a malfunction is detected; and

issuing an alarm when the count of malfunctions detected in any monitoring section reaches a predetermined number for the section.

10. The method according to claim 9, wherein
said injection molding machine is equipped with
an electrically driven die clamping unit using a toggle
mechanism, and said die clamping force is calculated
5 based on a torque of a motor for driving the toggle
mechanism and expansion/contraction amount of the
toggle mechanism.

11. A method of detecting a malfunction during
a die clamping step in an injection molding machine,
10 the method being applied when performing die clamping
by moving a movable platen toward a stationary platen,
comprising:

taking a reference pattern showing a relation
between a die clamping force and time when die clamping
15 is normally carried out;

setting one or more monitoring sections with
respect to said time on the basis of the reference
pattern, and setting, in advance, an allowable limit
value of the die clamping force in the respective
20 monitoring section in a form of a linear function of
said time; and

monitoring the die clamping force in the
respective monitoring section during the die clamping
step and, when its value exceeds said allowable limit
25 value, deciding that a malfunction occurs and counting
the number of times that a malfunction is detected; and
issuing an alarm when the count of malfunctions

detected within a predetermined time reaches
a predetermined number for the respective monitoring
section.

12. The method according to claim 11, wherein
5 said injection molding machine is equipped with
an electrically driven die clamping unit using a toggle
mechanism, and said die clamping force is calculated
based on a torque of a motor for driving the toggle
mechanism and expansion/contraction amount of the
10 toggle mechanism.

13. A method of detecting a malfunction during
a die clamping step in a hydraulic injection molding
machine, the method being applied when performing die
clamping by moving a movable platen toward a stationary
15 platen, comprising:

taking a reference pattern showing a relation
between a hydraulic pressure of a movable platen
driving hydraulic pump and a position of the movable
platen when die clamping is normally carried out;

20 setting one or more monitoring sections with
respect to said position on the basis of the reference
pattern, and setting, in advance, an allowable limit
value of the hydraulic pressure in the respective
monitoring section in a form of a linear function of
25 said position; and

monitoring the hydraulic pressure in the
respective monitoring section during the die clamping

step and, when its value exceeds said allowable limit value, issuing an alarm.

14. A method of detecting a malfunction during a die clamping step in a hydraulic injection molding machine, the method being applied when performing die clamping by moving a movable platen toward a stationary platen, comprising:

taking a reference pattern showing a relation between a hydraulic pressure of a movable platen driving hydraulic pump and a position of the movable platen when die clamping is normally carried out;

setting one or more monitoring sections with respect to said position on the basis of the reference pattern, and setting, in advance, an allowable limit value of the hydraulic pressure in the respective monitoring section in a form of a linear function of said position; and

monitoring the hydraulic pressure in the respective monitoring section during the die clamping step and, when its value exceeds said allowable limit value, deciding that a malfunction occurs and counting the number of times that a malfunctions is detected; and

issuing an alarm when the count of malfunctions detected in any monitoring section reaches a predetermined number for the section.

15. A method of detecting a malfunction during

a die clamping step in a hydraulic injection molding machine, the method being applied when performing die clamping by moving a movable platen toward a stationary platen, comprising:

5 taking a reference pattern showing a relation between a hydraulic pressure of a movable platen driving hydraulic pump and a position of the movable platen when die clamping is normally carried out;

 setting one or more monitoring sections with
10 respect to said position on the basis of the reference pattern, and setting, in advance, an allowable limit value of the hydraulic pressure in the respective monitoring section in a form of a linear function of said position; and

15 monitoring the hydraulic pressure in the respective monitoring section during the die clamping step and, when its value exceeds said allowable limit value, deciding that a malfunction occurs and counting the number of times that a malfunction is detected; and

20 issuing an alarm when the count of malfunctions detected within a predetermined time reaches a predetermined number for the respective monitoring section.

 16. A method of detecting a malfunction during
25 a die clamping step in a hydraulic injection molding machine, the method being applied when performing die clamping by moving a movable platen toward a stationary

platen, comprising:

5 taking a reference pattern showing a relation
between a hydraulic pressure of a movable platen
driving hydraulic pump and time when die clamping is
normally carried out;

 setting one or more monitoring sections with
respect to said time on the basis of the reference
pattern, and setting, in advance, an allowable limit
value of the hydraulic pressure in the respective
10 monitoring section in a form of a linear function of
said time; and

 monitoring the hydraulic pressure in the
respective monitoring section during the die clamping
step and, when its value exceeds said allowable limit
15 value, issuing an alarm.

17. A method of detecting a malfunction during
a die clamping step in a hydraulic injection molding
machine, the method being applied when performing die
clamping by moving a movable platen toward a stationary
20 platen, comprising:

 taking a reference pattern showing a relation
between a hydraulic pressure of a movable platen
driving hydraulic pump and time when die clamping is
normally carried out;

25 setting one or more monitoring sections with
respect to said time on the basis of the reference
pattern, and setting, in advance, an allowable limit

value of the hydraulic pressure in the respective monitoring section in a form of a linear function of said time; and

5 monitoring the hydraulic pressure in the respective section during the die clamping step and, when its value exceeds said allowable limit value, deciding that a malfunction occurs and counting the number of times that a malfunction is detected; and

10 issuing an alarm when the count of malfunctions detected in any monitoring section reaches a predetermined number for the section.

18. A method of detecting a malfunction during a die clamping step in a hydraulic injection molding machine, the method being applied when performing die clamping by moving a movable platen toward a stationary platen, comprising:

15 taking a reference pattern showing a relation between a hydraulic pressure of a movable platen driving hydraulic pump and time when die clamping is normally carried out;

20 setting one or more monitoring sections with respect to said time on the basis of the reference pattern, and setting, in advance, an allowable limit value of the hydraulic pressure in the respective monitoring section in a form of a linear function of said time; and

25 monitoring the hydraulic pressure in the

respective monitoring section during the die clamping step and, when its value exceeds said allowable limit value, deciding that a malfunction occurs and counting the number of times that a malfunction is detected; and

5 issuing an alarm when the count of malfunctions detected within a predetermined time reaches a predetermined number for the respective monitoring section.